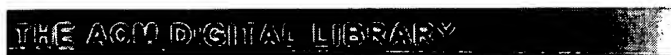



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1 [Seeing the forest for the trees: hierarchical displays of hypertext structures](#)



Steven Feiner

 April 1988 **ACM SIGOIS Bulletin , Proceedings of the ACM SIGOIS and IEEECS TC-OA 1988 conference on Office information systems**, Volume 9 Issue 2-3

Publisher: ACM Press

Full text available: pdf(2.07 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

Most recent hypertext systems support hierarchy only as a restricted subset of directed graph structure. Consequently they do not provide many of the capabilities for graphical information hiding and structure manipulation that a tree makes possible. This paper describes display techniques developed for IGD, a hypertext system that supports the creation of large graphical documents whose arbitrary directed graph structure is embedded in a strict hierarchy. IGD offers the full generality of ...

2 [Session C: Visualisation and simulation: Representation of hierarchical structures in 3D space](#)



André P. Calitz, Donald Munro

 November 2001 **Proceedings of the 1st international conference on Computer graphics, virtual reality and visualisation**

Publisher: ACM Press

Full text available: pdf(991.36 KB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Hierarchical structures are found in much of the data that is used in everyday life including organisational management hierarchies and computer directory structures. The effective visualisation of large hierarchical information structures on limited size and resolution computer displays is important. The evolution of multimedia user interfaces is moving towards 3D graphical user interfaces for certain applications. One possible use of 3D on the WWW would be to extend the concept of presenting i ...

Keywords: 3D Web Sites, Cone Tree, Hierarchical Structures, Object-Oriented Framework

3 [Multitrees: enriching and reusing hierarchical structure](#)



George W. Furnas, Jeff Zacks

 April 1994 **Proceedings of the SIGCHI conference on Human factors in computing systems: celebrating interdependence**

Publisher: ACM Press

Full text available:  [pdf\(810.31 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)


Keywords: directed graphs, graphical browsers, hierarchies, hypertext structures, information graphs, representation, reuse

4 Hierarchical parallel coordinates for exploration of large datasets

Ying-Huey Fua, Matthew O. Ward, Elke A. Rundensteiner

October 1999 **Proceedings of the conference on Visualization '99: celebrating ten years**

Publisher: IEEE Computer Society Press

Full text available:  [pdf\(1.84 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Our ability to accumulate large, complex (multivariate) data sets has far exceeded our ability to effectively process them in search of patterns, anomalies, and other interesting features. Conventional multivariate visualization techniques generally do not scale well with respect to the size of the data set. The focus of this paper is on the interactive visualization of large multivariate data sets based on a number of novel extensions to the parallel coordinates display technique. We devel ...

Keywords: hierarchical data exploration, large-scale multivariate data visualization, parallel coordinates

5 Structured Graphics for Distributed Systems



K. A. Lantz, W. I. Nowicki

January 1984 **ACM Transactions on Graphics (TOG)**, Volume 3 Issue 1

Publisher: ACM Press

Full text available:  [pdf\(2.15 MB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

6 Improving graphical information system model use with elision and connecting lines



Jouni Huotari, Kalle Lyytinen, Marketta Niemelä

March 2004 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 11 Issue 1

Publisher: ACM Press

Full text available:  [pdf\(217.95 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Graphical information system (IS) models are used to specify and design IS from several perspectives. Due to the growing size and complexity of modern information systems, critical design information is often distributed via multiple diagrams. This slows search performance and results in reading errors that later cause omissions and inconsistencies in the final designs. We study the impact of large screens and the two promising visual integration techniques of elision and connecting lines that c ...


Keywords: Information visualization, diagrammatic representation, spatial ability, spatial memory, visual search

7 The Quadtree and Related Hierarchical Data Structures




Hanan Samet

June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Publisher: ACM PressFull text available:  pdf(4.87 MB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)**8** Hierarchical data management

Jan M. Engel

September 1976 **Proceedings of the eighth international conference on APL****Publisher:** ACM PressFull text available:  pdf(1.13 MB)Additional Information: [full citation](#), [abstract](#), [index terms](#)

An APL program has been developed for storing and maintaining relevant information about a group of persons linked together by a structured hierarchy. Functions that create, modify, and develop useful output from the data set are described with reference to a working example which further illustrates the approach used.

9 A structural view of the Cedar programming environment

Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann

August 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 8 Issue 4**Publisher:** ACM PressFull text available:  pdf(6.32 MB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

10 Navigating hierarchically clustered networks through fisheye and full-zoom methods

Doug Schaffer, Zhengping Zuo, Saul Greenberg, Lyn Bartram, John Dill, Shelli Dubs, Mark Roseman


June 1996 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 3 Issue 2**Publisher:** ACM PressFull text available:  pdf(305.99 KB)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Many information structures are represented as two-dimensional networks (connected graphs) of links and nodes. Because these network tend to be large and quite complex, people often prefer to view part or all of the network at varying levels of detail. Hierarchical clustering provides a framework for viewing the network at different levels of detail by superimposing a hierarchy on it. Nodes are grouped into clusters, and clusters are themselves place into other clusters. Us ...

Keywords: data acquisition, fisheye views, hierarchically clustered graphs, information visualization, supervisory control

11 Formal Specification of Graphic Data Types

William R. Mallgren

October 1982 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 4 Issue 4**Publisher:** ACM PressFull text available:  pdf(1.30 MB)Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

12 Hierarchical flip zooming: enabling parallel exploration of hierarchical visualizations



Staffan Björk

May 2000 **Proceedings of the working conference on Advanced visual interfaces**

Publisher: ACM Press

Full text available: pdf(1.25 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

This paper describes hierarchical Flip Zooming, a focus+context visualization technique for hierarchical information sets. It allows for independent focus+context views at each node of the hierarchy and enables parallel exploration of different branches of the hierarchy. Visualization, navigation and interaction in the Flip Zooming technique is described as well as how the technique fits into existing models of information visualization. Examples of applications using the technique are give ...

Keywords: flip zooming, focus+context visualization, hierarchies, information visualization

13 Fractal views: a fractal-based method for controlling information display



Hideki Koike

July 1995 **ACM Transactions on Information Systems (TOIS)**, Volume 13 Issue 3

Publisher: ACM Press

Full text available: pdf(1.02 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

Computer users often must view large amounts of information through video displays which are physically limited in size. Although some methods, which automatically display/erase information units based on their degrees of importance, have been proposed, they lack an ability to keep the total amount of displayed information nearly constant. We propose a new method for information display based on fractal theory. By regarding the information structures used in computers as complex objects, we ...

Keywords: UI theory, abstracting methods, fractals, information visualization, program display

14 Visualization: Query, analysis, and visualization of hierarchically structured data using Polaris



Chris Stolte, Diane Tang, Pat Hanrahan

July 2002 **Proceedings of the eighth ACM SIGKDD international conference on Knowledge discovery and data mining**

Publisher: ACM Press

Full text available: pdf(10.02 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#)

In the last several years, large OLAP databases have become common in a variety of applications such as corporate data warehouses and scientific computing. To support interactive analysis, many of these databases are augmented with hierarchical structures that provide meaningful levels of abstraction that can be leveraged by both the computer and analyst. This hierarchical structure generates many challenges and opportunities in the design of systems for the query, analysis, and visualization of ...

15 An innovative approach to system requirements analysis by using structural modeling method

Norihisa Komoda, Koichi Haruna, Hiroyuki Kaji, Hiroshi Shinozawa

March 1981 **Proceedings of the 5th international conference on Software engineering**

Publisher: IEEE Press

Full text available:  [pdf\(658.46 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

As an innovative approach to the system requirements analysis, this paper proposes a computer aided method to develop objectives trees. This method consists of a procedure, algorithms and, a man-machine interactive graphic system. And two typical kinds of applications of the objectives tree in computer applications system planning are described. By this method, working man-hours to develop an objectives tree can be decreased, and quality of communication among system vendors, end-users of a ...

16 Visibility culling using hierarchical occlusion maps



Hansong Zhang, Dinesh Manocha, Tom Hudson, Kenneth E. Hoff

August 1997 **Proceedings of the 24th annual conference on Computer graphics and interactive techniques**

Publisher: ACM Press/Addison-Wesley Publishing Co.

Full text available:  [pdf\(597.69 KB\)](#) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

Keywords: hierarchical data structures, image pyramid, interactive display, occlusion culling, visibility culling

17 Gene expression data clustering and visualization based on a binary hierarchical clustering framework

Lap Keung Szeto, Alan Wee-Chung Liew, Hong Yan, Sy-sen Tang

January 2003 **Proceedings of the First Asia-Pacific bioinformatics conference on Bioinformatics 2003 - Volume 19 CRPITS '03**

Publisher: Australian Computer Society, Inc.

Full text available:  [pdf\(746.49 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

We describe the use of a binary hierarchical clustering (BHC) framework for clustering of gene expression data. The BHC algorithm involves two major steps. Firstly, the K-means algorithm is used to split the data into two classes. Secondly, the Fisher criterion is applied to the classes to assess whether the splitting is acceptable. The algorithm is applied to the subclasses recursively and ends when all clusters cannot be split any further. BHC does not require the number of clusters to be known ...

Keywords: K-means clustering, binary hierarchical clustering framework, Fisher linear discriminant, gene expression data analysis

18 Direct manipulation of temporal structures in a multimedia application framework



P. Ackermann

October 1994 **Proceedings of the second ACM international conference on Multimedia**

Publisher: ACM Press

Full text available:  [pdf\(883.13 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The design of complex multimedia documents presents new challenges to authoring systems, because spatial and temporal features should be visualized and made accessible in an intuitive and direct-manipulative way. In this study, multimedia presentations are considered as hierarchical compositions of time objects that define serial or parallel synchronization of the inserted media objects. Media composition hierarchies support

automatic temporal layout mechanisms. They are integrated into an ...

19 Combining hypertext and structured documents in Grif



Vincent Quint, Irène Vattou

December 1993 **Proceedings of the ACM conference on Hypertext**

Publisher: ACM Press

Full text available: pdf(1.02 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)



20 A comparison of set-based and graph-based visualisations of overlapping classification hierarchies



Martin Graham, Jessie B. Kennedy, Chris Hand

May 2000 **Proceedings of the working conference on Advanced visual interfaces**

Publisher: ACM Press

Full text available: pdf(1.58 MB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)



The visualisation of hierarchical information sets has been a staple of Information Visualisation since the field came into being in the early 1990's. However, at present, support for visualising the correlations between multiple, overlapping sets of hierarchical information has been lacking. This is despite the realisation that for certain tasks this information is as important as the information that forms the individual hierarchies. In response to this, we have produced two early visuali ...

Keywords: authors kit, conference publications, guides, instructions

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1 [A hierarchical access control model for video database systems](#)



Elisa Bertino, Jianping Fan, Elena Ferrari, Mohand-Said Hacid, Ahmed K. Elmagarmid, Xingquan Zhu

 April 2003 **ACM Transactions on Information Systems (TOIS)**, Volume 21 Issue 2

Publisher: ACM Press

Full text available: pdf(6.27 MB)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Content-based video database access control is becoming very important, but it depends on the progresses of the following related research issues: (a) efficient video analysis for supporting semantic visual concept representation; (b) effective video database indexing structure; (c) the development of suitable video database models; and (d) the development of access control models tailored to the characteristics of video data. In this paper, we propose a novel approach to support multilevel acce ...

Keywords: Video database models, access control, indexing schemes

2 [The Quadtree and Related Hierarchical Data Structures](#)



Hanan Samet

 June 1984 **ACM Computing Surveys (CSUR)**, Volume 16 Issue 2

Publisher: ACM Press

Full text available: pdf(4.87 MB)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

3 [Special issue: AI in engineering](#)



D. Sriram, R. Joobbani

 April 1985 **ACM SIGART Bulletin**, Issue 92

Publisher: ACM Press

Full text available: pdf(8.79 MB)

 Additional Information: [full citation](#), [abstract](#)

The papers in this special issue were compiled from responses to the announcement in the July 1984 issue of the SIGART newsletter and notices posted over the ARPAnet. The interest being shown in this area is reflected in the sixty papers received from over six countries. About half the papers were received over the computer network.

4 [Graph-based hierarchical conceptual clustering](#)

Istvan Jonyer, Diane J. Cook, Lawrence B. Holder

March 2002 **The Journal of Machine Learning Research**, Volume 2

Publisher: MIT Press

Full text available:  [pdf\(228.03 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Hierarchical conceptual clustering has proven to be a useful, although under-explored, data mining technique. A graph-based representation of structural information combined with a substructure discovery technique has been shown to be successful in knowledge discovery. The SUBDUE substructure discovery system provides one such combination of approaches. This work presents SUBDUE and the development of its clustering functionalities. Several examples are used to illustrate the validity of the app ...

Keywords: cluster analysis, clustering, concept formation, graph match, structural data


5 Structured hypertext with domain semantics



Weigang Wang, Roy Rada

October 1998 **ACM Transactions on Information Systems (TOIS)**, Volume 16 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(593.99 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

One important facet of current hypertext research involves using knowledge-based techniques to develop and maintain document structures. A semantic net is one such technique. However, most semantic-net-based hypertext systems leave the linking consistency of the net to individual users. Users without guidance may accidentally introduce structural and relational inconsistencies in the semantic nets. The relational inconsistency hinders the creation of domain information models. The structura ...

Keywords: graph theory, hypertext models, hypertext structures


6 A structural view of the Cedar programming environment



Daniel C. Swinehart, Polle T. Zellweger, Richard J. Beach, Robert B. Hagmann

August 1986 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 8 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(6.32 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

This paper presents an overview of the Cedar programming environment, focusing on its overall structure—that is, the major components of Cedar and the way they are organized. Cedar supports the development of programs written in a single programming language, also called Cedar. Its primary purpose is to increase the productivity of programmers whose activities include experimental programming and the development of prototype software systems for a high-performance personal computer. T ...

7 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

Full text available:  [pdf\(4.21 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our

experience, such tools display repeated occurrences of non-trivial commun ...

8 Integrating symbolic images into a multimedia database system using classification and abstraction approaches

Aya Soffer, Hanan Samet

December 1998 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 7 Issue 4

Publisher: Springer-Verlag New York, Inc.

Full text available:  pdf(227.30 KB) Additional Information: [full citation](#), [abstract](#), [index terms](#)

Symbolic images are composed of a finite set of symbols that have a semantic meaning. Examples of symbolic images include maps (where the semantic meaning of the symbols is given in the legend), engineering drawings, and floor plans. Two approaches for supporting queries on symbolic-image databases that are based on image content are studied. The classification approach preprocesses all symbolic images and attaches a semantic classification and an associated certainty factor to each object that ...

Keywords: Image indexing, Multimedia databases, Query optimization, Retrieval by content, Spatial databases, Symbolic-image databases

9 Graphical interaction with heterogeneous databases

T. Catarci, G. Santucci, J. Cardiff

May 1997 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 6 Issue 2

Publisher: Springer-Verlag New York, Inc.

Full text available:  pdf(602.82 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

During the past few years our research efforts have been inspired by two different needs. On one hand, the number of non-expert users accessing databases is growing apace. On the other, information systems will no longer be characterized by a single centralized architecture, but rather by several heterogeneous component systems. In order to address such needs we have designed a new query system with both user-oriented and multidatabase features. The system's main components are an adaptive visua ...

10 Scalable feature selection, classification and signature generation for organizing large text databases into hierarchical topic taxonomies

Soumen Chakrabarti, Byron Dom, Rakesh Agrawal, Prabhakar Raghavan

August 1998 **The VLDB Journal — The International Journal on Very Large Data Bases**, Volume 7 Issue 3

Publisher: Springer-Verlag New York, Inc.

Full text available:  pdf(281.37 KB) Additional Information: [full citation](#), [abstract](#), [citations](#), [index terms](#)

We explore how to organize large text databases hierarchically by topic to aid better searching, browsing and filtering. Many corpora, such as internet directories, digital libraries, and patent databases are manually organized into topic hierarchies, also called *taxonomies*. Similar to indices for relational data, taxonomies make search and access more efficient. However, the exponential growth in the volume of on-line textual information makes it nearly impossible to maintain such taxono ...

11 Visualization: Query, analysis, and visualization of hierarchically structured data using Polaris

Chris Stolte, Diane Tang, Pat Hanrahan

July 2002 **Proceedings of the eighth ACM SIGKDD international conference on Knowledge discovery and data mining**

Publisher: ACM Press

Full text available:  [pdf\(10.02 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

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12 Hierarchical file organization and its application to similar-string matching



Tetsuro Ito, Makoto Kizawa

September 1983 **ACM Transactions on Database Systems (TODS)**, Volume 8 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(1.54 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The automatic correction of misspelled inputs is discussed from a viewpoint of similar-string matching. First a hierarchical file organization based on a linear ordering of records is presented for retrieving records highly similar to any input query. Then the spelling problem is attacked by constructing a hierarchical file for a set of strings in a dictionary of English words. The spelling correction steps proceed as follows: (1) find one of the best-match strings which are most similar to ...

Keywords: best match, file organization, good match, hierarchical clustering, linear ordering, office automation, similar-string, similarity, spelling correction, text editor

13 Session C: Visualisation and simulation: Representation of hierarchical structures in 3D space



André P. Calitz, Donald Munro

November 2001 **Proceedings of the 1st international conference on Computer graphics, virtual reality and visualisation**

Publisher: ACM Press

Full text available:  [pdf\(991.36 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

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Keywords: 3D Web Sites, Cone Tree, Hierarchical Structures, Object-Oriented Framework

14 Final report of the ANSI/X3/SPARC DBS-SG relational database task group



July 1982 **ACM SIGMOD Record**, Volume 12 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(4.69 MB\)](#) Additional Information: [full citation](#)


15 A comparison of set-based and graph-based visualisations of overlapping classification hierarchies





Martin Graham, Jessie B. Kennedy, Chris Hand

May 2000 Proceedings of the working conference on Advanced visual interfaces**Publisher:** ACM PressFull text available:  [pdf\(1.58 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)


The visualisation of hierarchical information sets has been a staple of Information Visualisation since the field came into being in the early 1990's. However, at present, support for visualising the correlations between multiple, overlapping sets of hierarchical information has been lacking. This is despite the realisation that for certain tasks this information is as important as the information that forms the individual hierarchies. In response to this, we have produced two early visuali ...

Keywords: authors kit, conference publications, guides, instructions**16 Data bubbles: quality preserving performance boosting for hierarchical clustering** Markus M. Breunig, Hans-Peter Kriegel, Peer Kröger, Jörg SanderMay 2001 **ACM SIGMOD Record , Proceedings of the 2001 ACM SIGMOD international conference on Management of data SIGMOD '01**, Volume 30 Issue 2**Publisher:** ACM PressFull text available:  [pdf\(397.09 KB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

In this paper, we investigate how to scale hierarchical clustering methods (such as OPTICS) to extremely large databases by utilizing data compression methods (such as BIRCH or random sampling). We propose a three step procedure: 1) compress the data into suitable representative objects; 2) apply the hierarchical clustering algorithm only to these objects; 3) recover the clustering structure for the whole data set, based on the result for the compressed data. The key issue in this approach is ...

Keywords: clustering, data compression, database mining, sampling**17 An object-oriented database for the display measurement and analysis system** Yihong Qian, Edward A. Fox, Willard W. FarleyDecember 1993 **Proceedings of the second international conference on Information and knowledge management****Publisher:** ACM PressFull text available:  [pdf\(823.60 KB\)](#)Additional Information: [full citation](#), [references](#), [index terms](#)**18 Browsing through databases**

Andrew J. Palay, Mark S. Fox

June 1980 **Proceedings of the 3rd annual ACM conference on Research and development in information retrieval****Publisher:** Butterworth & Co.Full text available:  [pdf\(587.33 KB\)](#)Additional Information: [full citation](#), [references](#), [citations](#)**19 Human-computer interface development: concepts and systems for its management** H. Rex Hartson, Deborah HixMarch 1989 **ACM Computing Surveys (CSUR)**, Volume 21 Issue 1**Publisher:** ACM PressFull text available:  [pdf\(7.97 MB\)](#)Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Human-computer interface management, from a computer science viewpoint, focuses on the process of developing quality human-computer interfaces, including their representation, design, implementation, execution, evaluation, and maintenance. This survey presents important concepts of interface management: dialogue independence, structural modeling, representation, interactive tools, rapid prototyping, development methodologies, and control structures. *Dialogue independence* is th ...

20 An analysis of geometric modeling in database systems



Alfons Kemper, Mechtild Wallrath

March 1987 **ACM Computing Surveys (CSUR)**, Volume 19 Issue 1

Publisher: ACM Press

Full text available: pdf(2.95 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

The data-modeling and computational requirements for integrated computer aided manufacturing (CAM) databases are analyzed, and the most common representation schemes for modeling solid geometric objects in a computer are described. The *primitive instancing* model, the *boundary representation*, and the *constructive solid geometry* model are presented from the viewpoint of database representation. Depending on the representation scheme, one can apply geometric transformation ...

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1 [Isomorphism testing and display of symmetries in dynamic trees](#)

Siu-Wing Cheng, Moon-Pun Ng

 January 1996 **Proceedings of the seventh annual ACM-SIAM symposium on Discrete algorithms**

Publisher: Society for Industrial and Applied Mathematics

 Full text available: [pdf\(1.25 MB\)](#)

 Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

2 [Introducing Ada 9X](#)

John Barnes

 November 1993 **ACM SIGAda Ada Letters**, Volume XIII Issue 6

Publisher: ACM Press

 Full text available: [pdf\(4.39 MB\)](#)

 Additional Information: [full citation](#), [citations](#), [index terms](#)

3 [Fast detection of communication patterns in distributed executions](#)

Thomas Kunz, Michiel F. H. Seuren

 November 1997 **Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research**

Publisher: IBM Press

 Full text available: [pdf\(4.21 MB\)](#)

 Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

4 [Online analytic processing \(OLAP\): QC-trees: an efficient summary structure for semantic OLAP](#)

Laks V. S. Lakshmanan, Jian Pei, Yan Zhao

 June 2003 **Proceedings of the 2003 ACM SIGMOD international conference on Management of data**

Publisher: ACM Press

 Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index](#)

Full text available:  [pdf\(375.81 KB\)](#)

[terms](#)

Recently, a technique called quotient cube was proposed as a summary structure for a data cube that preserves its semantics, with applications for online exploration and visualization. The authors showed that a quotient cube can be constructed very efficiently and it leads to a significant reduction in the cube size. While it is an interesting proposal, that paper leaves many issues unaddressed. Firstly, a direct representation of a quotient cube is not as compact as possible and thus still wast ...

5 Using model dataflow graphs to reduce the storage requirements of constraints



Bradley T. Vander Zanden, Richard Halterman

September 2001 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 8 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(1.28 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Dataflow constraints allow programmers to easily specify relationships among application objects in a natural, declarative manner. Most constraint solvers represent these dataflow relationships as directed edges in a dataflow graph. Unfortunately, dataflow graphs require a great deal of storage. Consequently, an application with a large number of constraints can get pushed into virtual memory, and performance degrades in interactive applications. Our solution is based on the observation that obj ...

Keywords: Class-instance model, dataflow constraints, graphical interfaces, language design and implementation, programming environments, prototype-instance model, storage optimization

6 Structured programming using processes



Jay Nelson

September 2004 **Proceedings of the 2004 ACM SIGPLAN workshop on Erlang**

Publisher: ACM Press

Full text available:  [pdf\(116.57 KB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

Structured Programming techniques are applied to a personal accounting software application implemented in erlang as a demonstration of the utility of processes as design constructs. Techniques for enforcing strong encapsulation, partitioning for fault isolation and data flow instrumentation, reusing code, abstracting and adapting interfaces, simulating inputs, managing and distributing resources and creating complex application behavior are described. The concept of *inductive decomposition*

Keywords: COPL, concurrency oriented programming language, erlang, inductive decomposition

7 TransformGen: automating the maintenance of structure-oriented environments



David Garlan, Charles W. Krueger, Barbara Staudt Lerner

May 1994 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 16 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(3.10 MB\)](#)

Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#), [review](#)

A serious problem for programs that use persistent data is that information created and maintained by the program becomes invalid if the persistent types used in the program are modified in a new release. Unfortunately, there has been little systematic treatment of the problem; current approaches are manual, ad hoc, and time consuming both for programmers and users. In this article we present a new approach. Focusing on the special case of managing abstract syntax trees in structure-oriente ...

Keywords: schema evolution, structure-oriented environments, type evolution

8 An overview of the X toolkit



Joel McCormack, Paul Asente

January 1988 **Proceedings of the 1st annual ACM SIGGRAPH symposium on User Interface Software**

Publisher: ACM Press

Full text available: pdf(1.09 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

The X11 Window System defines a network protocol [6] for communication between a graphics server and an application. The X library [3] provides a procedural interface to the protocol. The X toolkit [4] is an object-oriented construction kit built on top of the X library. The toolkit is used to write user interface components ("widgets"), to organize a set of widget instances into a complete user interface, and to link a user interface with the functionality provided b ...

9 Partial entity structure: a compact non-manifold boundary representation based on partial topological entities



Sang Hun Lee, Kunwoo Lee

May 2001 **Proceedings of the sixth ACM symposium on Solid modeling and applications**

Publisher: ACM Press

Full text available: pdf(1.06 MB)

Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

Non-manifold boundary representations have gained a great deal of popularity in recent years and various representation schemes have been proposed because they allow an even wider range of objects for various applications than conventional manifold representations. However, since these schemes are mainly interested in describing sufficient adjacency relationships of topological entities, the models represented in these schemes occupy too much storage space redundantly although they are very e ...

Keywords: boundary representation, data structure, geometric modeling, non-manifold, topological entity

10 Collision detection and proximity queries



Sunil Hadap, Dave Eberle, Pascal Volino, Ming C. Lin, Stephane Redon, Christer Ericson

August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

Publisher: ACM Press

Full text available: pdf(11.22 MB)

Additional Information: [full citation](#), [abstract](#)

This course will primarily cover widely accepted and proved methodologies in collision detection. In addition more advanced or recent topics such as continuous collision detection, ADFs, and using graphics hardware will be introduced. When appropriate the methods discussed will be tied to familiar applications such as rigid body and cloth simulation, and will be compared. The course is a good overview for those developing applications in physically based modeling, VR, haptics, and robotics.

11 The Rendezvous architecture and language for constructing multiuser applications



Ralph D. Hill, Tom Brinck, Steven L. Rohall, John F. Patterson, Wayne Wilner

June 1994 **ACM Transactions on Computer-Human Interaction (TOCHI)**, Volume 1 Issue 2

Publisher: ACM Press

Full text available:  [pdf\(3.25 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#), [review](#)

When people have meetings or discussions, frequently they use conversational props: physical models, drawings, or other concrete representations of information used to enhance the exchange of information. If the participants are geographically separated, it is difficult to make effective use of props since each physical prop can only exist in one place. Computer applications that allow two or more users to simultaneously view and manipulate the same data can be used to augm ...

Keywords: CSCW, UIMS, constraint maintenance, synchronous groupware

12 Simplify: a theorem prover for program checking



David Detlefs, Greg Nelson, James B. Saxe
May 2005 **Journal of the ACM (JACM)**, Volume 52 Issue 3

Publisher: ACM Press

Full text available:  [pdf\(1.93 MB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

This article provides a detailed description of the automatic theorem prover Simplify, which is the proof engine of the Extended Static Checkers ESC/Java and ESC/Modula-3. Simplify uses the Nelson--Oppen method to combine decision procedures for several important theories, and also employs a matcher to reason about quantifiers. Instead of conventional matching in a term DAG, Simplify matches up to equivalence in an E-graph, which detects many relevant pattern instances that would be missed by th ...

Keywords: Theorem proving, decision procedures, program checking

13 Shape-based retrieval and analysis of 3D models



Thomas Funkhouser, Michael Kazhdan
August 2004 **Proceedings of the conference on SIGGRAPH 2004 course notes GRAPH '04**

Publisher: ACM Press

Full text available:  [pdf\(12.56 MB\)](#) Additional Information: [full citation](#), [abstract](#)

Large repositories of 3D data are rapidly becoming available in several fields, including mechanical CAD, molecular biology, and computer graphics. As the number of 3D models grows, there is an increasing need for computer algorithms to help people find the interesting ones and discover relationships between them. Unfortunately, traditional text-based search techniques are not always effective for 3D models, especially when queries are geometric in nature (e.g., find me objects that fit into thi ...

14 On the efficiency of pairing heaps and related data structures



Michael L. Fredman
July 1999 **Journal of the ACM (JACM)**, Volume 46 Issue 4

Publisher: ACM Press

Full text available:  [pdf\(191.73 KB\)](#) Additional Information: [full citation](#), [abstract](#), [references](#), [citings](#), [index terms](#), [review](#)

The pairing heap is well regarded as an efficient data structure for implementing priority queue operations. It is included in the GNU C++ library. Strikingly simple in design, the pairing heap data structure nonetheless seems difficult to analyze, belonging to the genre of self-adjusting data structures. With its design originating as a self-adjusting analogue of the Fibonacci heap, it has been previously conjectured that the pairing heap provides constnant amortized time decrease-key ope ...

Keywords: Fibonacci heaps, amortized complexity analysis, lower bounds, priority queues, self-adjusting data structures

15 XIRQL: An XML query language based on information retrieval concepts



Norbert Fuhr, Kai Großjohann

April 2004 **ACM Transactions on Information Systems (TOIS)**, Volume 22 Issue 2

Publisher: ACM Press

Full text available: pdf(281.91 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#)

XIRQL ("circle") is an XML query language that incorporates imprecision and vagueness for both structural and content-oriented query conditions. The corresponding uncertainty is handled by a consistent probabilistic model. The core features of XIRQL are (1) document ranking based on index term weighting, (2) specificity-oriented search for retrieving the most relevant parts of documents, (3) datatypes with vague predicates for dealing with specific types of content and (4) structural vagueness f ...

Keywords: Path algebra, XML, XQuery, probabilistic retrieval, ranked retrieval, vague predicates

16 The complexity of XPath query evaluation and XML typing



Georg Gottlob, Christoph Koch, Reinhard Pichler, Luc Segoufin

March 2005 **Journal of the ACM (JACM)**, Volume 52 Issue 2

Publisher: ACM Press

Full text available: pdf(447.53 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We study the complexity of two central XML processing problems. The first is XPath 1.0 query processing, which has been shown to be in PTIME in previous work. We prove that both the data complexity and the query complexity of XPath 1.0 fall into lower (highly parallelizable) complexity classes, while the combined complexity is PTIME-hard. Subsequently, we study the sources of this hardness and identify a large and practically important fragment of XPath 1.0 for which the combined complexity is L ...

Keywords: Complexity, DTD, LOGCFL, XML, XPath

17 CLAW, a high level, portable, Ada 95 binding for Microsoft Windows



Randall Brukardt, Tom Moran

November 1997 **Proceedings of the conference on TRI-Ada '97**

Publisher: ACM Press

Full text available: pdf(2.00 MB) Additional Information: [full citation](#), [references](#), [citations](#), [index terms](#)

18 Tools and software process: Presenting crosscutting structure with active models



Wesley Coelho, Gail C. Murphy

March 2006 **Proceedings of the 5th international conference on Aspect-oriented software development AOSD '06**

Publisher: ACM Press

Full text available: pdf(252.93 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

When modifying or debugging a software system, among other tasks, developers must often understand and manipulate source code that crosscuts the system's structure. These tasks are made more difficult by limitations of the two approaches currently used to present details of crosscutting structure: tree views and structural diagrams. Tree views

force the developer to manually synthesize information from multiple views; structure diagrams quickly suffer from graphical complexity. We introduce an < ...

Keywords: AspectJ, aspect-oriented programming, design views, program structure, structure presentation

19 Abstract state machines capture parallel algorithms



Andreas Blass, Yuri Gurevich

October 2003 **ACM Transactions on Computational Logic (TOCL)**, Volume 4 Issue 4

Publisher: ACM Press

Full text available: pdf(610.28 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [index terms](#)

We give an axiomatic description of parallel, synchronous algorithms. Our main result is that every such algorithm can be simulated, step for step, by an abstract state machine with a background that provides for multisets.

Keywords: ASM thesis, Parallel algorithm, abstract state machine, postulates for parallel computation

20 Integrating object-oriented programming and protected objects in Ada 95



A. J. Wellings, B. Johnson, B. Sanden, J. Kienzle, T. Wolf, S. Michell

May 2000 **ACM Transactions on Programming Languages and Systems (TOPLAS)**, Volume 22 Issue 3

Publisher: ACM Press

Full text available: pdf(245.47 KB) Additional Information: [full citation](#), [abstract](#), [references](#), [citations](#), [index terms](#), [review](#)

Integrating concurrent and object-oriented programming has been an active research topic since the late 1980's. There is now a plethora of methods for achieving this integration. The majority of approaches have taken a sequential object-oriented language and made it concurrent. A few approaches have taken a concurrent language and made it object-oriented. The most important of this latter class is the Ada 95 language, which is an extension to the object-based concurrent programming language ...

Keywords: Ada 95, concurrency, concurrent object-oriented programming, inheritance anomaly

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END OF SEARCH HISTORY